

CLAIMS:

1. Elastic interface device for coupling or connecting at least two structural parts, wherein said elastic interface device allows preferably a relative displacement or movement between said two structural parts, characterized in that at least one constrained-layer damping structure (15, 16; 23, 24) is incorporated or integrated into said elastic interface device (10; 19; 20).
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2. Elastic interface device according to claim 1, characterized in that the or each constrained-layer damping structure (15, 16; 23, 24) is attached, preferably fixedly attached, to said elastic interface device (10; 19; 20).
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3. Elastic interface device according to claim 1, characterized in that the or each constrained-layer damping structure (15, 16; 23, 24) is attached, preferably fixedly attached, to at least one flexible portion (14; 25) of said elastic interface device (10; 19; 20).
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4. Elastic interface device according to claim 3, characterized in that the or each constrained-layer damping structure (15, 16; 23, 24) has a stiffness in the same order of magnitude as or at least not negligible compared to the or each flexible portion (14; 25) of said elastic interface device (10; 19; 20).
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5. Elastic interface device according to claim 3 or 4, characterized in that the or each constrained-layer damping structure (15, 16; 23, 24) comprises at least two layers, a first viscous or viscoelastic layer (17; 26) and a second constraining layer (18; 27).
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6. Elastic interface device according to claim 5, characterized in that the first viscous or viscoelastic layer (17; 26) is sandwiched between the flexible portion (14; 25) of said elastic interface device (10; 19; 20) and said second constraining layer (18; 27).
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7. Elastic interface device according to claim 5 or 6, characterized in that the first viscous or viscoelastic layer (17; 26) is made of a viscous or viscoelastic material.

8. Elastic interface device according to claim 5 or 6, characterized in that the second constraining layer (18; 27) is made of a material similar to the material of which the flexible portion (14; 25) of said elastic interface device (10; 19; 26) is made.

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9. Elastic interface device according to claim 1, characterized in that the elastic interface device (10, 19, 20) is formed into a monolithic structure (11), wherein the elastic interface device (10, 19, 20) separates the monolithic structure (11) into at least two structural parts, wherein said two structural parts are coupled or connected by said elastic interface
10 device.

10. Elastic interface device according to claim 1, characterized in that the elastic interface device (10; 19; 20) is designed as a leaf spring, wherein at least one portion (14; 25) of said leaf spring is flexible, and wherein the or each constrained-layer damping structure
15 (15, 16; 23, 24) is attached, preferably fixedly attached, to the or each flexible portion (14; 25).

11. Elastic interface device according claim 10, characterized in that said leaf spring comprises a stiffened middle portion (13) and at least one flexible end portion (14),
20 wherein the or each constrained layer damping structure (15, 16) is fixedly attached to the or each flexible end portion (14).

12. Elastic interface device according claim 11, characterized in that two constrained-layer damping structures (15, 16) are symmetrically attached to each flexible end
25 portion (14), in a way that on both sides of each end portion there is attached one constrained-layer damping structure.

13. Elastic interface device according claim 10, characterized in that at least one constrained-layer damping structure (23, 24) is fixedly attached to a flexible middle portion
30 (25) of said leaf spring.

14. Elastic interface device according claim 13, characterized in that two constrained-layer damping structures (23, 24) are symmetrically attached to the flexible

middle portion (25), in a way that on both sides of said middle portion there is attached one constrained-layer damping structure.

15. Elastic interface device according claim 11 or 13, characterized in that each
5 constrained-layer damping structure (15, 16; 23, 24) comprises two layers, a first viscous or viscoelastic layer (17; 26) and a second constraining layer (18; 27), wherein the first layer is sandwiched between the flexible portion and said second layer.

16. Elastic interface device according claim 11, characterized in that the second
10 constraining layers (18) have a direct contact to the structural part (12), but not to the leaf spring, or alternatively, the second constraining layers (18) have a direct contact to the stiffened middle portion (13), but not to the structural part (12).